Claims

What is claimed is:

1. An adaptive optics system for minimizing the effects of scintillations on images received by the adaptive optics system, comprising:

a deformable mirror that is illuminated with optical energy;

a plurality of actuators for moving portions of the deformable mirror;

a wavefront sensor comprising a plurality of subapertures for receiving optical energy that is reflected from the deformable mirror and for determining a slope and amplitude of the optical energy in each subaperture;

a slope weighting function in communication with the wavefront sensor for receiving the slope and amplitude information for each subaperture from the wavefront sensor and for processing the slope and amplitude information;

a matrix multiplier in communication with the slope weighting function for receiving the processed slope and amplitude information and for generating control signals that control the actuators.

2. The adaptive optics system of claim 1, wherein the slope weighting function increases the weight of slope measurements for subapertures having amplitudes higher than an average amplitude.

3. The adaptive optics system of claim 1, wherein the slope weighting function decreases the weight of slope of measurements for subapertures having amplitudes lower than an average amplitude.

4. The adaptive optics system of claim 1, wherein the slope weighting function processes the slope and amplitude information to produce an average amplitude measurement and weighted slopes.

5. The adaptive optics system of claim 4, wherein the weighted slopes are generated by multiplying the slope of the subaperture by the amplitude of that subaperture and dividing the slope by the average amplitude measurement.

6. The adaptive optics system of claim 4, wherein the average amplitude measurement is produced by taking the average of the amplitudes of all subapertures.

7. The adaptive optics system of claim 1, wherein each subaperture corresponds to a plurality of actuators.

8. The adaptive optics system of claim 1, wherein the deformable mirror is controlled by 941 actuators.

9. The adaptive optics system of claim 1, further comprising a servo compensator for controlling the actuators.

10. A method for minimizing the effects of scintillations on images received by the adaptive optics system, comprising the steps of:

illuminating a deformable mirror with optical energy;

receiving optical energy from the deformable mirror in a plurality of subapertures;

determining a slope and amplitude of the optical energy received by each subaperture;

processing the slope and amplitude information to weight slope measurements; and

moving portions of the deformable mirror using a plurality of actuators.

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11. The method of claim 1, wherein the step of processing the slope and amplitude of the optical energy includes the step of increasing the weight of slope measurements for subapertures having amplitudes higher than an average amplitude.

12. The method of claim 10, wherein the step of processing the slope and amplitude of the optical energy includes the step of decreasing the weight of slope measurements for subapertures having amplitudes lower than an average amplitude.

13. The method of claim 1, wherein the step of processing the slope and amplitude of the optical energy includes the steps of producing an average amplitude measurement and weighted slopes.

14. The method of claim 13, wherein the weighted slopes are generated by multiplying the slope of the subaperture by the amplitude of that subaperture and dividing the slope by the average amplitude measurement.

15. The method of claim 13, wherein the average amplitude measurement is produced by taking the average of the amplitudes of all subapertures.